Examination of a Recently Developed Epibenthic Index for New Jersey Estuaries

Region 2 Regional Applied Research Effort (RARE) Project

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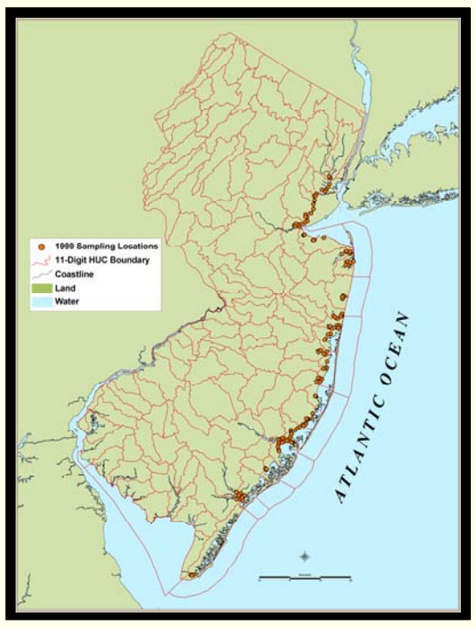
The Problem:

- Limited guidance for biological assessment of estuaries
- Dynamic nature of estuaries complicates assessment
- Use of existing infaunal indices expensive and slow (time and cost of benthic enumeration)

Project Objective:

Examine application of epifaunal index developed by TetraTech and Region 2 and compare this index to the infaunal index (traditional EMAP approach)

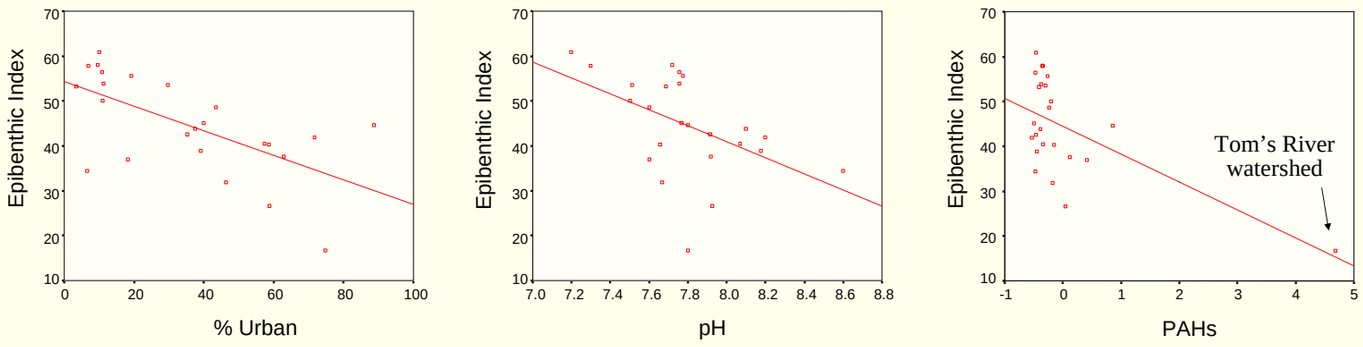


Project Approach:

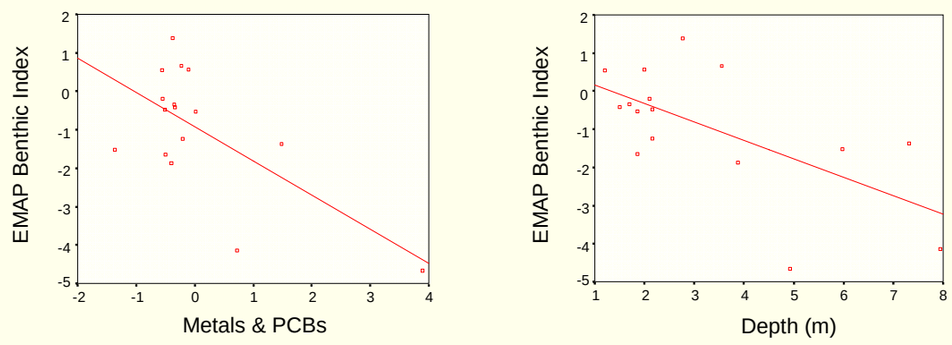
1. Assemble data:
   - Benthic data: Epibenthic index, Infaunal (EMAP) Index
   - Land Use: Anderson Level I (Forested, Urban, Ag, etc.)
   - Water quality: depth, DO, salinity, pH, temperature
   - Sediment quality: TOC, % silt-clay, metals & organics
2. Associate all data with subwatersheds (11 digit HUCs)
3. Correlate epifaunal index with infaunal index
4. Develop regression models between indices and land use, water quality and sediment quality measures.

Findings:

- Epibenthic Index significantly correlated with Infaunal Index (Spearman's $\rho = 0.397$)
- Epibenthic Index explained by % urban, pH, and PAHs (adj R^2=0.637); without Tom's River Epibenthic Index = % urban + pH (adj R^2=0.464)



- Infaunal (EMAP) Index explained by metals & PCBs and depth (adj R^2=0.512)



So…

- **Epibenthic Index response related to other indices used to assess biological impairment**
- **Epibenthic Index sensitive to land use and water quality but not sediment quality**
- **Infaunal (EMAP) Index sensitive to sediment contamination but not land use (in this area)**

Products:

- Briefing to the State of New Jersey
- Presentation at Estuarine Research Federation annual meeting

What's Next?

- Incorporation of additional data to reduce variability and increase strength of models
- Final report/manuscript on applicability of epibenthic index in New Jersey estuaries

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